Lesson 2

Red velvet mites

Decomposers and Scavengers

Decomposers possess unique abilities to break down matter chemically and convert it into its simplest components: carbon, nitrogen, hydrogen, and oxygen. Other organisms, called scavengers, help with this "break down"; scavengers do not, however, break down material into its simplest components.

Instead, through their feeding process and physical digestion, they break down material into smaller pieces for "true" decomposers to work on. In the end, decomposers complete the process. In order for students to be able to identify "true" decomposers, they must understand this difference.

In Lesson 2, students describe different decomposers and learn to distinguish "true" decomposers from scavengers. Students define the term "scavenger," review the definition of a decomposer, and compare the two definitions. They look at a series of photographs featuring "true" decomposers and scavengers and use clues in the captions to categorize each organism as a decomposer or a scavenger. The ability to distinguish true decomposers from scavengers helps students build on their knowledge about the role of decomposers in ecosystems.

Learning Objective

Give examples of organisms that are decomposers.

Explain the role of decomposers in an ecosystem.

Background

Decomposers are organisms that feed on dead plants, animals, and other organic matter. These organisms carry out the natural process of decomposition. Decomposers obtain the energy and matter they need for growth from dead organic matter. Bacteria and fungi are decomposers.

Sometimes people refer to organisms like earthworms, pill bugs, and mites as decomposers because they also consume dead organic matter. Other scavengers known for eating carrion (animal carcasses) are typically larger animals; these scavengers include coyotes and vultures like the California condor. Although their biting, chewing, and swallowing do assist with decomposition, these organisms on their own are not capable of chemically breaking down matter into its elemental components. For this reason, they are scavengers rather than "true" decomposers. "True" decomposers are capable of digesting many complex chemical molecules and reducing them to carbon and inorganic components such as nitrogen.

For example, consider leaves that fall to the forest floor. Over time, they become weathered. The smaller bits of leaf litter mix with the soil; scavengers like the earthworm eventually eat these smaller bits. The earthworm's gizzard grinds the leaf litter into even smaller pieces, which pass into its intestine. Inside the earthworm's intestine, bacteria feed on the tiny pieces of leaves and begin to break them down chemically. The earthworm is not capable of this chemical digestion on its own. Instead, the earthworm excretes nutrient-rich waste known as "castings," and bacteria feed on the castings and continue to break them down chemically. As the bacteria complete the decomposition process, they release carbon, nitrogen, hydrogen, and oxygen trapped within the leaf litter back into the natural system. These elements are then available for another use. If bacteria were not capable of chemical digestion, then earthworms and other scavengers could only breakdown organic matter to a certain point, and nutrient cycles that support natural systems could not continue.

Leaf eaten by scavengers

Key Vocabulary

Fungus: An organism such as a mushroom that obtains energy and matter primarily from dead organic matter.

Microorganism: An organism such as a bacterium or fungus that is seen only with the aid of a microscope.

Scavenger: An organism that obtains energy and matter by eating dead organisms.

Toolbox

Summary of Activities

Students match descriptions of decomposers and scavengers to the pictures and names of actual organisms. They compare characteristics of decomposers to those of scavengers. Using clues, students identify examples of decomposers and scavengers on photo cards.

Instructional Support

See Extensions & Unit Resources, page 30.

Prerequisite Knowledge

Students should have:

- completed the previous lesson.

Advanced Preparation

Gather and prepare Activity Masters.

Gather and prepare Materials Needed:

- **My Decomposition Book**

Gather and prepare Visual Aids:

- Cut apart the **Decomposers and Scavengers Photo Cards** (Visual Aid #1–4).

Add to Word Wall.

Materials Needed

Class supplies:

- Pencils, scissors, tape

Visual Aids

Photo cards:

- **Decomposers and Scavengers,** Visual Aids # 1–4

Duration

Preparation Time
20 min.

Instructional Time
50 min.

Safety Notes

None

Activity Masters in the Supporting Materials (SM)

No Activity Masters are required for this lesson.

Procedures

Vocabulary Development

Use the **Unit Dictionary** and the **Vocabulary Word Wall Cards** to introduce new words to students as appropriate. These documents are provided separately.

Step 1

Distribute students' copies of **My Decomposition Book**. Instruct students to read over the definitions of vocabulary words they have already filled in on page 1. While students are reading, place the **Decomposers and Scavengers Photo Cards** (Visual Aids #1–4) face up on various tables around the room, one card per table.

When you have placed the **Decomposers and Scavengers Photo Cards** around the room, have students turn to page 5 in their copies of **My Decomposition Book**. Read through the instructions for completing the page.

Step 2

Assign four students to each of the tables on which you placed one of the photo cards of **Decomposers and Scavengers**. Ask students to look at each photo card, read the caption, and take note of the number written in the left-hand corner of the card. Tell students to write the name of the organism in the correct box on page 5 of ***My Decomposition Book***. Remind them that the name next to the number on page 5 should match the number they see on the photo card at their table.

When the groups have finished examining their first photo, have them rotate from table to table every three minutes until every student has had a chance to see every photo. When they have all completed the task, have the students return to their regular seats. Collect the photo cards from the tables.

Step 3

Review with students the Key Vocabulary and definitions for "decomposer" and "scavenger" on the word list (see Advanced Preparation). Remind students what they learned from the ***Wonderful Compost*** story about chemical decomposers and physical decomposers, or scavengers. Ask students, "What is the main difference between decomposers and scavengers?" (*Only decomposers can break down dead plants and animals into their simplest parts. Scavengers can grind, bite, or tear the matter into smaller pieces, but they cannot break it down chemically.)*

Have students locate the new Key Vocabulary terms on pages 1 and 2 in their copies of ***My Decomposition Book*** and fill in the definition for each.

Step 4

Ask students, "Which organisms on the photo cards are scavengers?" *(California condor, earthworm, millipede, pill bug, blowfly)* As students name these, hold up these photo cards for the class to see, and then tape them to one side of the board. Ask students, "Which organisms on the photo cards are decomposers?" (*Bacteria, mold, mushroom, blowfly)* As students name these, hold up these photo cards for the class to see, then tape them to the other side of the board.

Write "Scavengers" above the group of photo cards showing scavengers and "Decomposers" above the group of photo cards showing the decomposers.

Point to the photo of the blowfly once again. Tell students that the blowfly belongs in both categories. It uses its mouth parts to bite and suck up food, but also uses chemicals to soften the food it bites into its basic chemical components.

Step 5

Instruct students to write a letter "D" next to the organism names on page 5 of ***My Decomposition Book*** that are decomposers and "S" next to the organisms that are scavengers. Read each of the names of the organisms aloud as students do this. *(Number 1 is bacteria [D], number 2 is a California condor [S], number 3 is an earthworm [S], number 4 is mold–a type of fungus [D], number 5 is a mushroom–also a type of fungus [D], number 6 is a millipede [S], number 7 is a blowfly [both S and D], and number 8 is a pill bug [S].)*

Step 6

Instruct students to answer the questions below the list of organisms on page 5 of ***My Decomposition Book***. When students are finished, collect their copies of ***My Decomposition Book*** to use in assessment.

Lesson Assessment

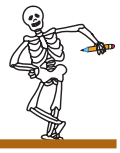
Description

This lesson teaches students about the role decomposers play in ecosystems. Key to the lesson is helping students distinguish between scavengers and "true" decomposers. It also provides students with additional examples of decomposers. Students' work on page 5 of **My Decomposition Book** demonstrates that they can give examples of decomposers and explain their role in an ecosystem.

Suggested Scoring

Use the Answer Key provided on page 51 to assess students' work.

Answer Key and Sample Answers



Decomposer or Scavenger?

Decomposition takes a team effort! Making it happen requires two kinds of organisms. You are about to see photos of both kinds of organisms.

Write the name of each organism you see next to the number of its photo:

1. *bacteria (D)*	5. *mushroom (D)*
2. *California condor (S)*	6. *millipede (S)*
3. *earthworm (S)*	7. *blowfly (S and D)*
4. *mold (D)*	8. *pill bug (S)*

How are scavengers and decomposers different?

Scavengers bite and chew to break down what they eat. Decomposers use chemicals to break down what they eat.

How do decomposers and scavengers work together?

Scavengers break things into smaller pieces that are easier for the decomposers to work on.

What do scavengers and decomposers get from eating dead things?

They get their food and energy from eating dead things.

5

1 **Decomposers and Scavengers Photo Cards**
Visual Aid — Photo Cards Front

1 **Decomposers and Scavengers Photo Cards**
Visual Aid — Photo Cards Back

1. We are microscopic, one-celled organisms. You can't see us, but we are everywhere and we can break down almost anything. (**Bacteria)**

2. I am a type of bird. My excellent eyesight helps me to find my food from far away. I eat dead animals. (**California condor)**

2 **Decomposers and Scavengers Photo Cards**
Visual Aid — Photo Cards Front

2 **Decomposers and Scavengers Photo Cards**
Visual Aid — Photo Cards Back

3. My body is long, soft, and made up of segments. I tunnel through the soil and eat bacteria, fungi, and rotting plant parts.
(Earthworm)

4. I am a fungus. I am blue and gray in color. You can often find me on old food like bread and fruit, which I break down. I like damp places.
(Mold)

3 **Decomposers and Scavengers Photo Cards**
Visual Aid — Photo Cards Front

3 **Decomposers and Scavengers Photo Cards**
Visual Aid — Photo Cards Back

5. I am a fungus. I often have a thick stem called a stalk and a cap that looks like an umbrella. I sometimes live on trees and other living things.
(Mushroom)

6. I have a rounded worm-like body, and I have many legs. I can be several inches long and come in a variety of colors. I eat rotting plants.
(Millipede)

4 **Decomposers and Scavengers Photo Cards**
Visual Aid — Photo Cards Front

7. Blowfly

8. Pill bug

4 **Decomposers and Scavengers Photo Cards**
Visual Aid — Photo Cards Back

7. When I am young, I am a maggot. I can smell dead animals from 10 miles away. I use chemicals to soften the food I suck up and eat.
(Blowfly)

8. I have seven pairs of legs. I roll up in a ball when I am bothered. I like to eat leaves that have fallen off plants.
(Pill Bug)